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PATENTED MAR. 31, 1908.

S. BORTON & L. D. BIRGE.

SEAM.

APPLICATION FILED JUNE 2, 1906. RENEWED NOV. 23, 1907.

2 SHEETS—SHEET 1.

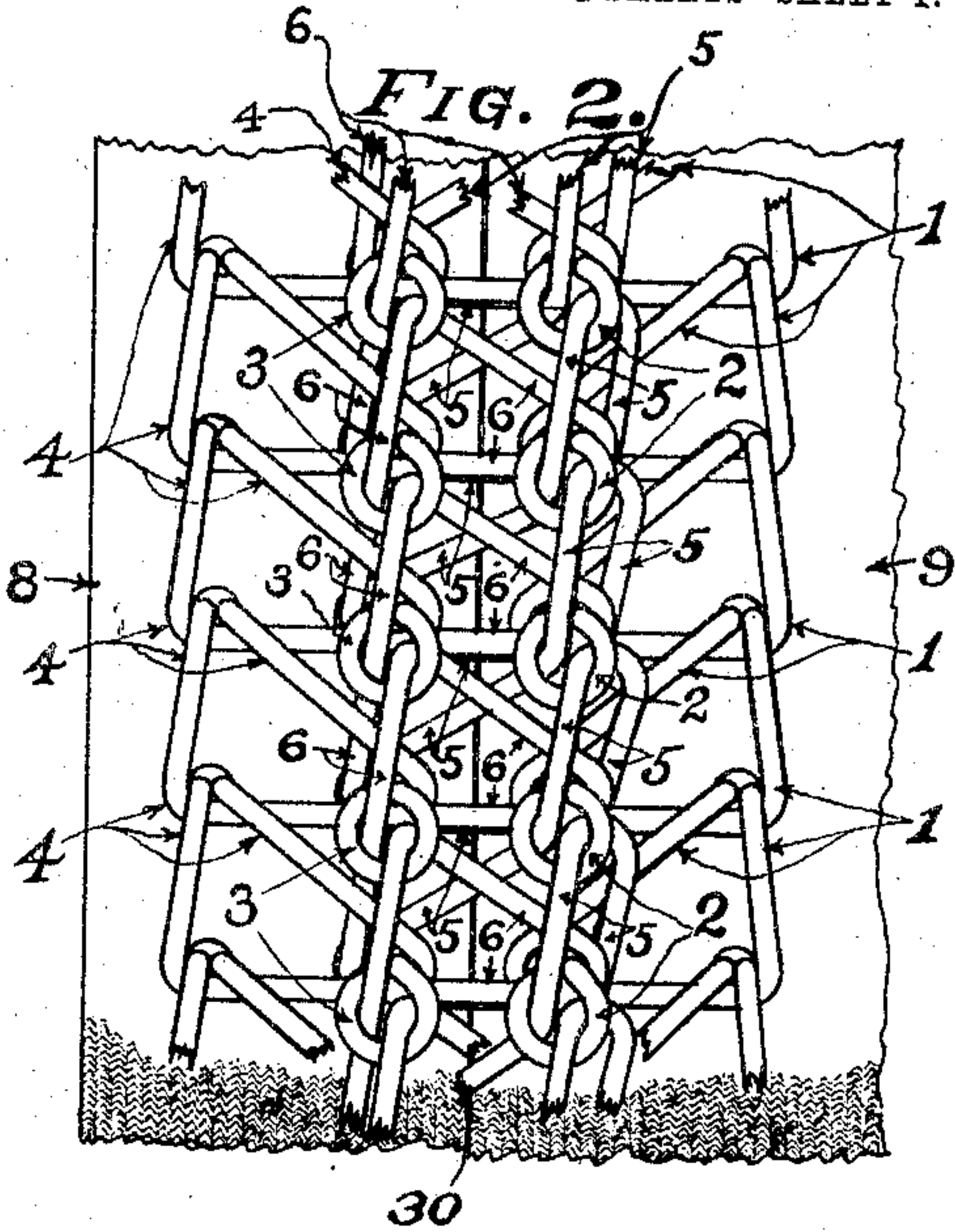
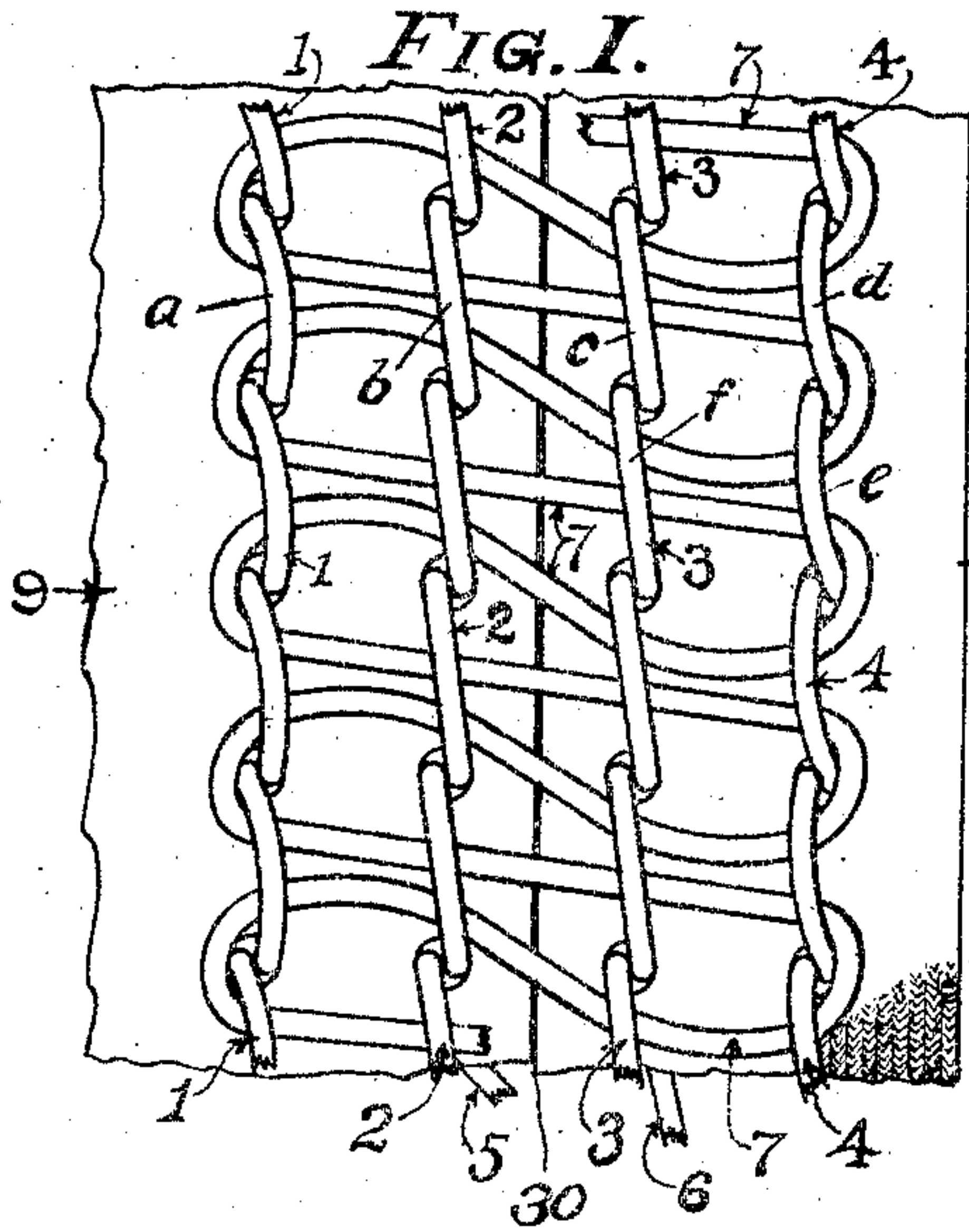


FIG. 3.

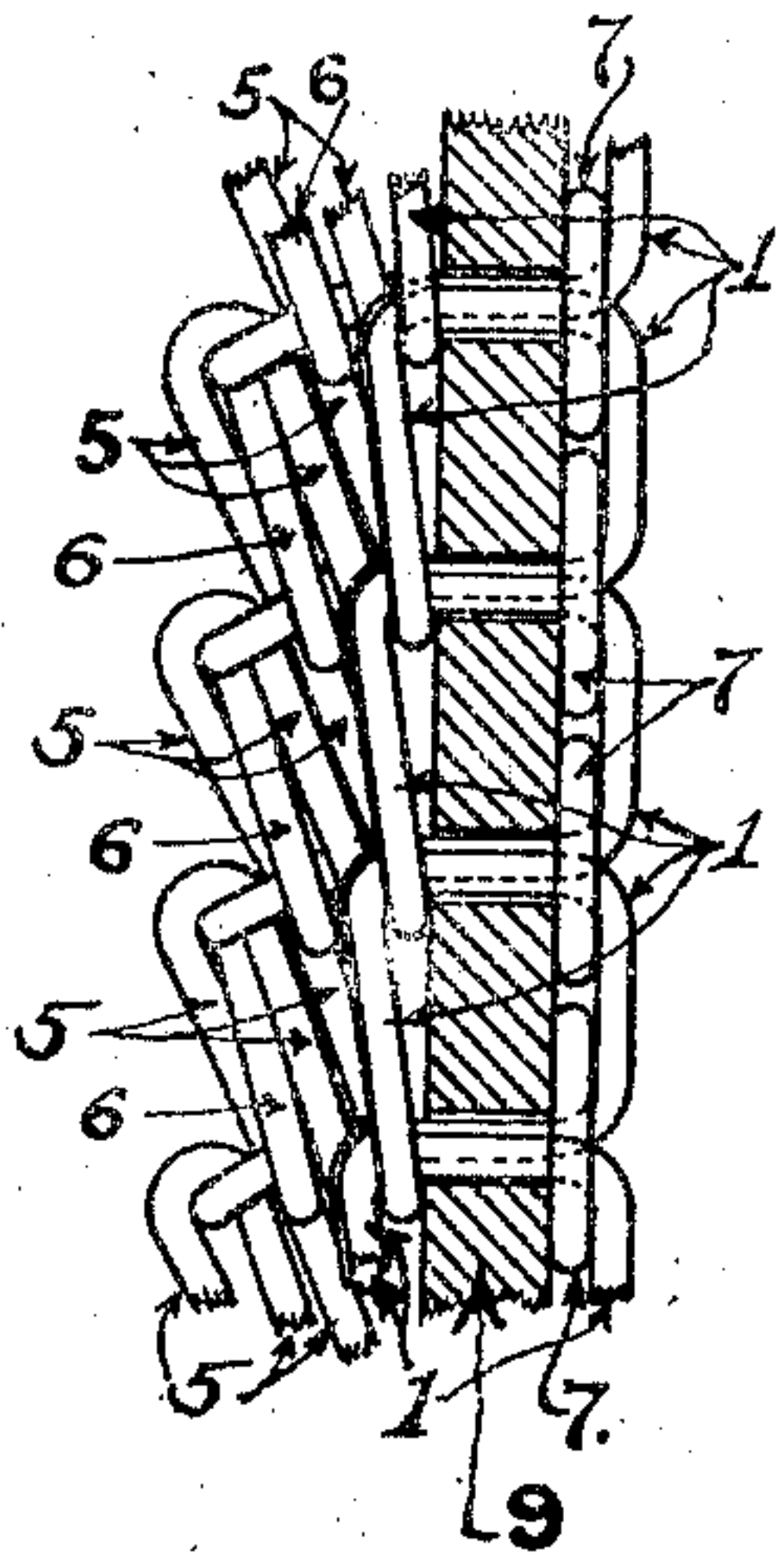
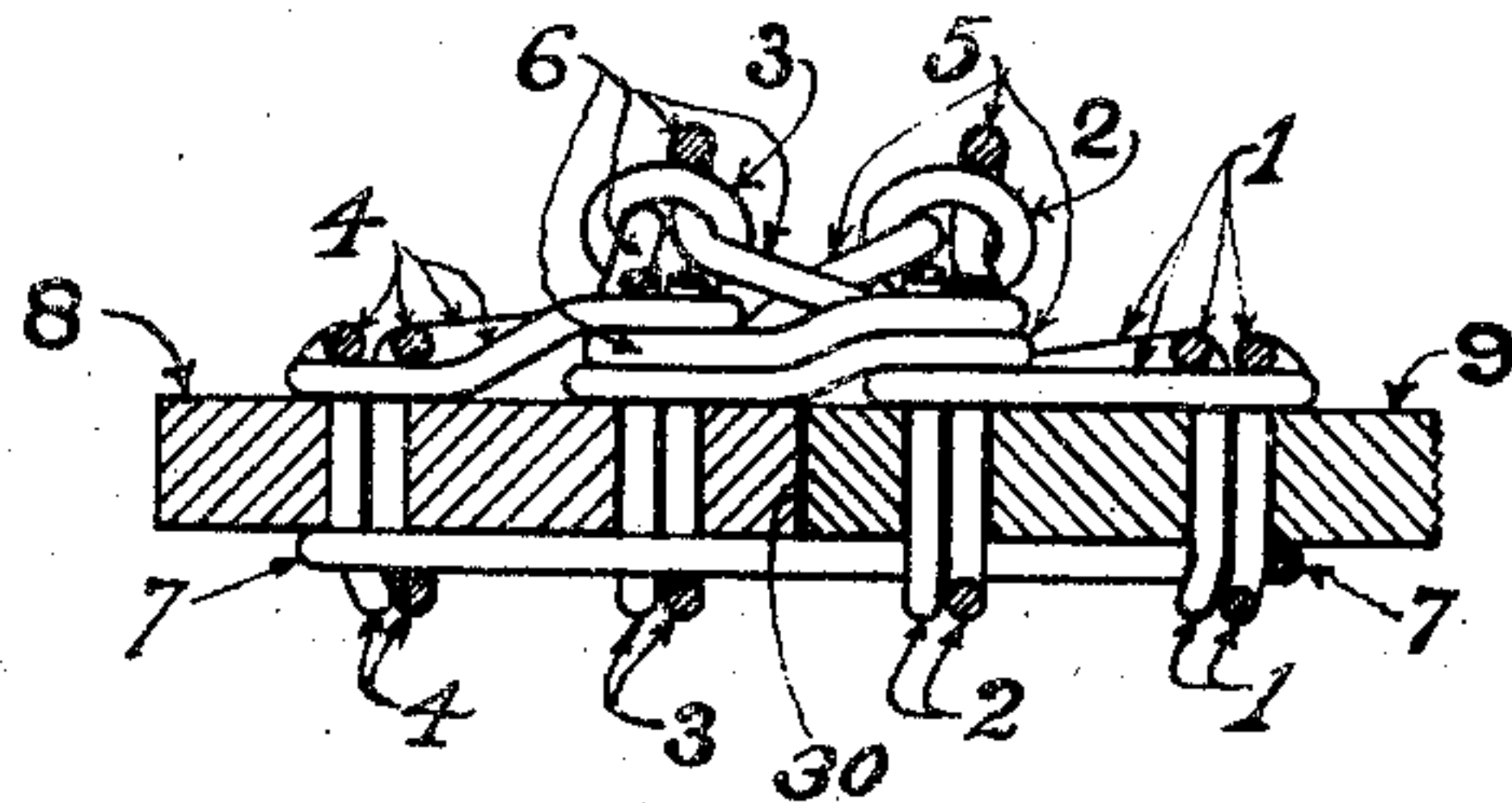


FIG. 4.



WITNESSES.

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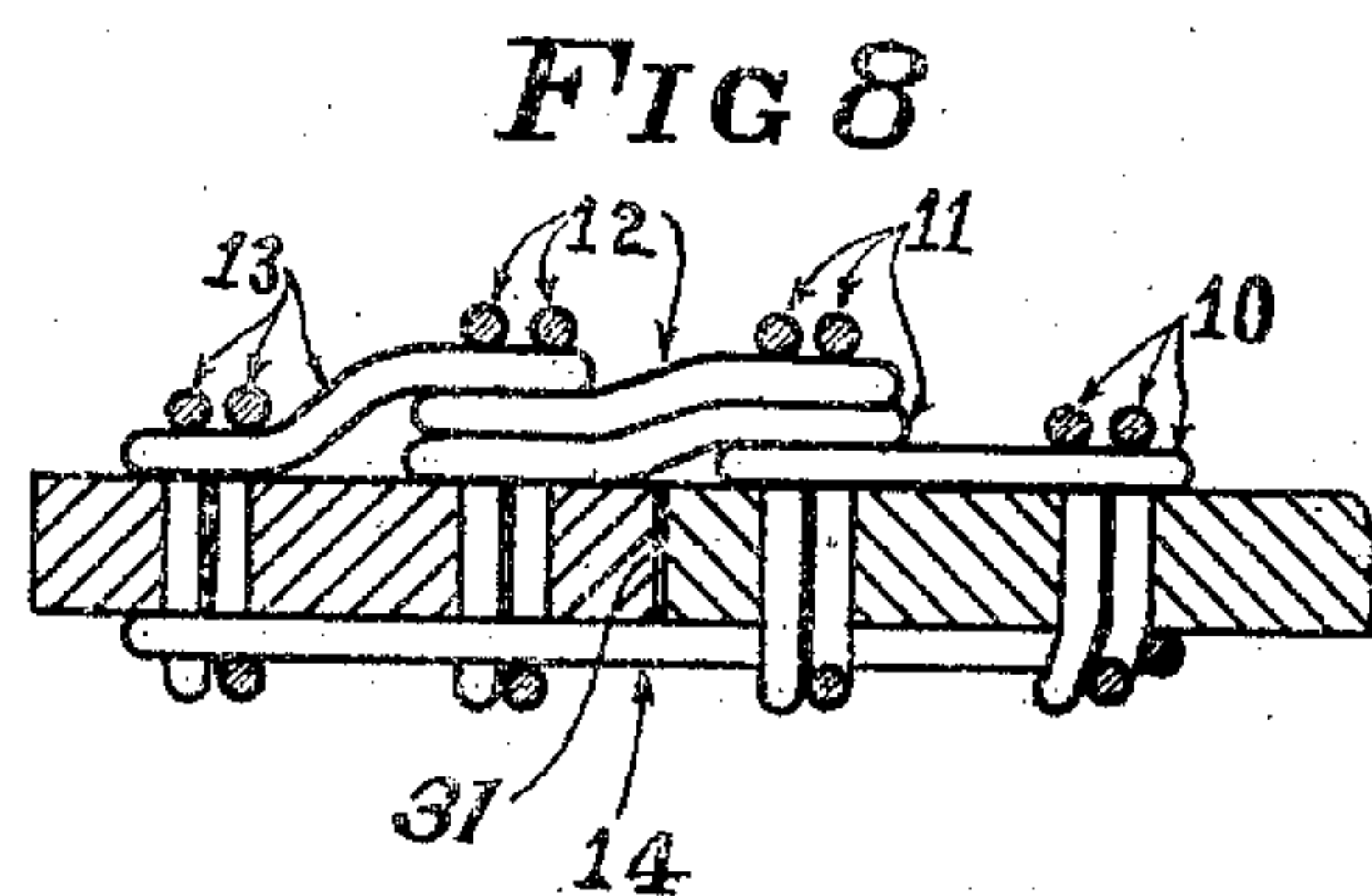
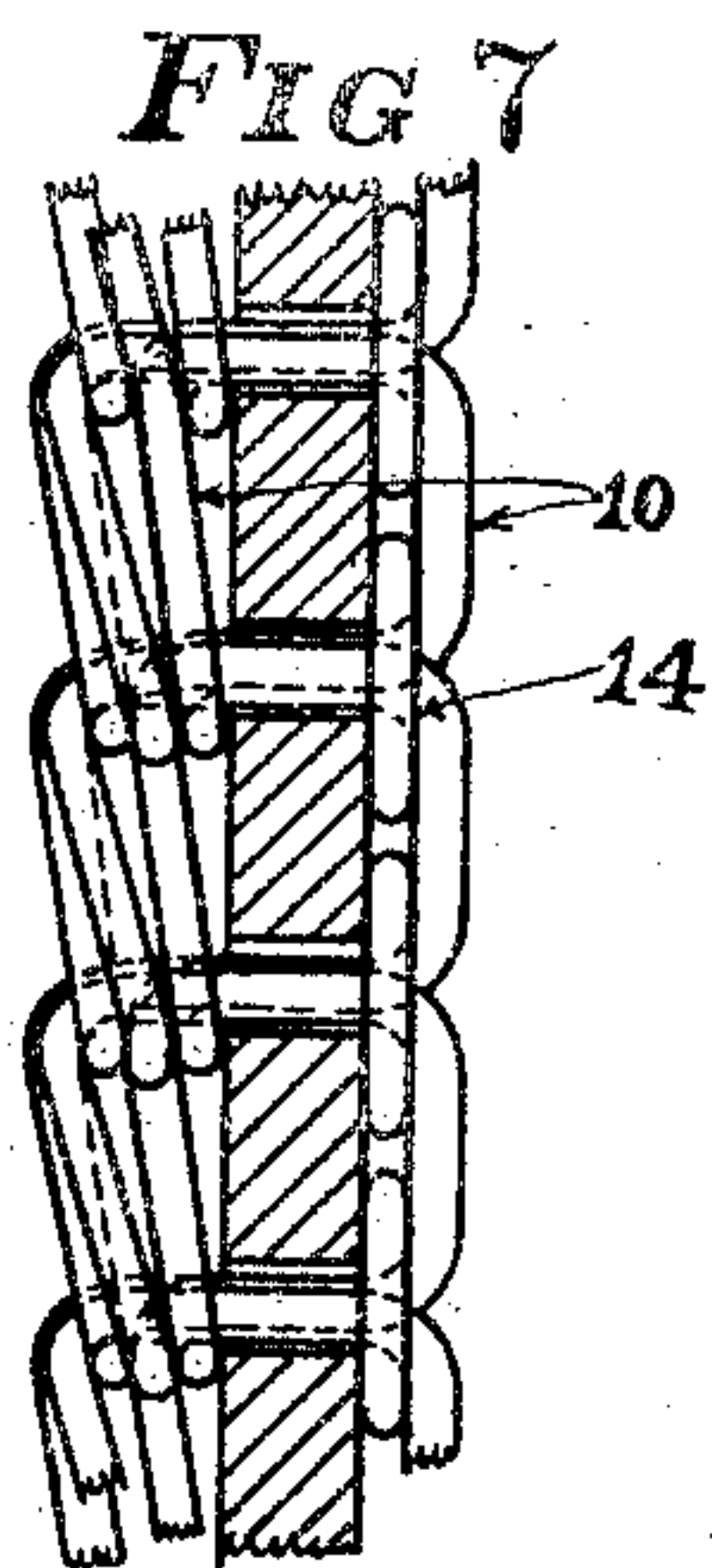
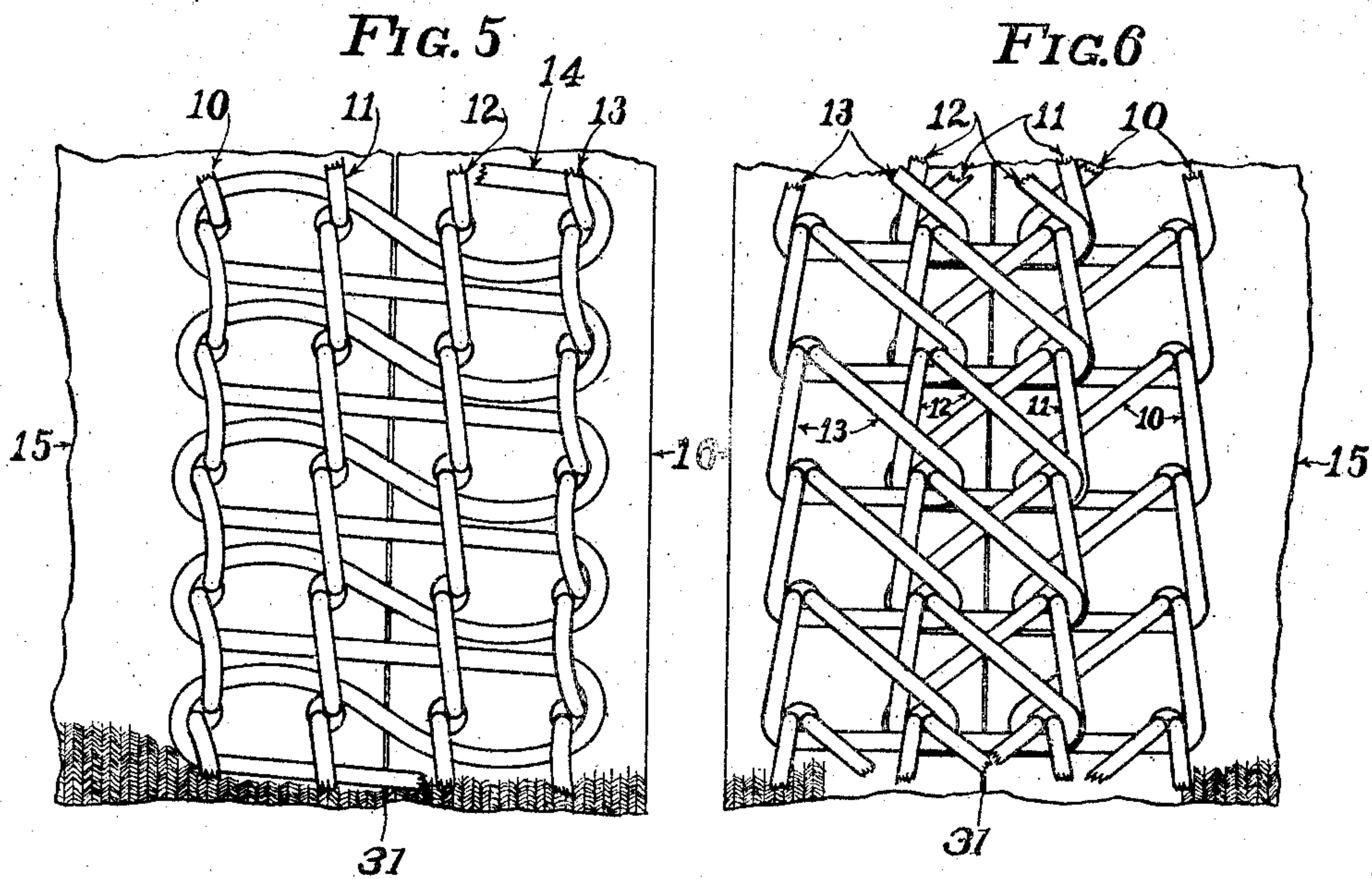
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2 SHEETS—SHEET 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

STOCKTON BORTON AND LLEWELLYN D. BIRGE, OF PROVIDENCE, RHODE ISLAND, ASSIGN-
ORS, BY DIRECT AND MESNE ASSIGNMENTS, TO WILCOX & GIBBS SEWING MACHINE
COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SEAM.

No. 883,615.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed June 2, 1906, Serial No. 319,959. Renewed November 23, 1907. Serial No. 403,540.

To all whom it may concern:

Be it known that we, STOCKTON BORTON and LLEWELLYN D. BIRGE, of Providence, Rhode Island, have invented a new and use-
ful Improvement in Seams, which improve-
ment is fully set forth in the following speci-
fication.

The improved seam constituting our pres-
ent invention is particularly designed for and
adapted to joining together the edges of cut-
knit goods, but may also be employed to ad-
vantage with other kinds of fabrics and for
ornamental and other purposes.

Our principal object is to provide a seam,
capable of being made by a single operation
of a suitable machine, which will securely
join two abutting edges of cut-knit goods,
cover and secure the thread ends of the rough
raw edges, thereby preventing said thread
ends from sticking up and marring the
smoothness, appearance and finish of the
seam. A seam accomplishing these objects
is described and generically claimed in an
application filed March 9, 1906, Serial No.
305,140, by Stockton Borton, one of the joint
inventors of the seam described and claimed
herein, the latter being a species of the ge-
neric invention of the aforesaid application.

The improvements constituting the pres-
ent invention may be most readily described
in conjunction with the accompanying draw-
ings, illustrating several embodiments there-
of, and wherein, Figures 1 and 2 are plan views
on opposite sides, respectively, showing on an
enlarged scale two abutting edges of fabric
or cut-knit goods joined by a seam; Fig. 3 is
a side elevation from the right of Fig. 2, with
the goods in section; Fig. 4 is an end view,
partly in section, looking from the lower end
of Fig. 2; Figs. 5, 6, 7 and 8 are views similar
to Figs. 1, 2, 3 and 4, respectively, showing
another embodiment of the invention.

Assuming the seam of Figs. 1 to 4 to be
formed in a suitable machine in which the
needles operate from above to form lines of
both single-thread chain-stitches and two-
thread chain stitches, Fig. 1 shows the upper
side and Fig. 2 the lower side of the seam as
formed on the goods in passing through the
machine; for convenience, they will be re-
ferred to in the description which follows as
the "upper" and "lower" sides of the seam.
The seam may, however, be formed in a ma-
chine in which the needles operate from be-

low, in which case the relation of the sides
would be reversed. The seam may also be
so formed that either of its sides, but prefer-
ably the side formed by the needle and cross-
threads, appear on the right or outer side of
the goods when in use.

3 and 9 are two pieces of fabric, such for
example as cut-knit goods, the opposing or
abutting edges of which are brought together
along the line 30. The seam is formed of
seven threads, namely, the four needle-
threads 1, 2, 3 and 4 on the upper side, loops
of these threads being carried through the
goods to the lower side; a cross-thread 7 on
the upper side; and finally, two hook-
threads 5 and 6 on the lower side. The nee-
dle-threads 1, 2, 3 and 4, together with the
two hook-threads 5 and 6, form four parallel
or approximately parallel rows of stitches,
two rows on either side of the meeting line 30
of the two edges to be joined. On the upper
side, Fig. 1, the cross-thread 7, in running to
the right, always passes beneath four
stitches (*a*, *b*, *c*, and *d* for example) of the four
parallel lines of stitches, all of said stitches
being in transverse alinement; in returning,
said cross-thread passes beneath the next
succeeding stitch (*e* and *f*, for example) in
each of the two parallel lines of stitches in the
fabric 8, but beneath the same stitches (*a*
and *b*, for example) in fabric 9. It follows
that at the outer edges of the upper side of
the seam, the cross-thread 7 forms a succes-
sion of loops each passing through two adja-
cent stitches, and connecting each end of
every stitch to the end of an adjacent stitch.
On the under side, the needle thread 4 forms
a succession of approximately triangular-
shaped loops, each loop passing through its
preceding loop and to the right around the
shank of a loop in needle-thread 3, and so on.
The single needle-thread 4 thus forms chain
stitches the loops of which are on one side of
the goods carried to the right (Fig. 2) into
engagement with an adjacent line of stitches.
In a similar manner, the needle-thread 1
forms a succession of approximately triangu-
lar-shaped loops, each loop passing through
its preceding loop and to the left around the
shank of a loop in the needle-thread 2, and so
on. The single needle-thread 1 thus forms
chain stitches the loops of which are, on one
side of the goods, carried to the left into en-
gagement with an adjacent line of stitches.

Also on the under side, the hook-thread 6, after passing through a loop in the needle-thread 3, passes around the shank of the next succeeding loop in thread 3, then to the right around the shank of a loop in needle-thread 2, thence backward and upward again through the loop in thread 3 through which it first passed, and so on. Likewise, the hook-thread 5, after passing through a loop in the needle-thread 2, is carried to the left around the shank of a loop in needle-thread 3, thence around the shank of the next loop in needle-thread 2; thence backward and upward again through the loop in thread 2 through which it first passed, and so on. As shown in Fig. 4, of the three loops around the shank of the loop in needle-thread 3, the loop in hook-thread 5 lies next to the fabric, with the loop in hook-thread 6 between it and the loop in needle-thread 4; and of the three thread-loops around the shank of the loop in the needle-thread 2, the loop in needle-thread 1 lies next to the fabric, while the loop in hook-thread 5 lies between it and the loop in hook-thread 6. These loops may assume this or any other relative arrangement, according to the manner of operation of the mechanism used in the formation thereof.

In the embodiment of the invention shown in Figs. 5 to 8, 15 and 16 are the two pieces of fabric, the opposing or abutting edges of which are brought together along the line 31. The seam in this instance is formed of five threads, namely, the four needle-threads 10, 11, 12 and 13 on the upper side, loops of these threads being carried through the goods to the lower side; and a cross-thread 14 on the upper side. The needle-threads 10, 11, 12 and 13 form four parallel or approximately parallel rows of single-thread chain-stitches, two rows on either side of the meeting line 31 of the two edges to be joined. On the upper side (Fig. 5) the cross-thread 14 is arranged in the same manner as already explained with reference to cross-thread 7 of Fig. 1. On the under side, each of the needle threads 10, 11, 12 and 13 forms a succession of approximately triangular-shaped loops, each loop passing through its preceding loop and to one side around the shank of a loop in the adjacent line of stitches. As shown in Fig. 6, the triangular-shaped loops of the needle-thread 13 extend to the right around the shank of similar loops in the needle-thread 12. The triangular-shaped loops of needle-thread 12 pass to the right around the shanks of similar loops in the needle-thread 11. The triangular-shaped loops of needle-thread 10 pass to the left around the shanks of similar loops in needle-thread 11; and the triangular-shaped loops of needle-thread 11 pass to the left around the shanks of the similar loops in needle-thread 12. As shown in Fig. 8, of the three needle-thread loops

around the shank of the loop in needle-thread 12, the loop in needle-thread 11 lies next to the fabric, with the loop in needle-thread 12 between it and the loop in needle-thread 13; and of the three needle-thread loops around the shank of the loop in needle-thread 11, the loop in needle-thread 10 lies next to the fabric, with the loop in needle-thread 11 between it and the loop in needle-thread 12. These loops may assume this or any other relative arrangement, according to the manner of operation of the mechanism used in the formation thereof.

In the seam or seams formed as above explained, the two inside parallel lines of stitches may, without danger of being pulled out, be placed very near the abutting edges of the two pieces of goods, as the outer parallel rows of stitches take a wide hold on the goods, and are principally relied upon to resist transverse strain or pull tending to separate the joined edges. The cross-thread on one side, and the crossing of the needle and hook threads on the other side (as in Figs. 1—4) or the crossing of the needle-threads only on said other side (as in Figs. 5—8) binds together the four parallel rows of stitches, and therefore distributes and equalizes all strain or pull tending to separate the connected edges. Furthermore, the disposition of the threads, and particularly the crossing of said threads, gives advantageous elasticity to the seam. The crossing of threads twice across the line of abutment for each stitch, affords a double covering of cross-threads at the middle of the seam where they are most needed to catch, hold down and confine projecting thread-ends, when the same is employed to connect two edges of the cut-knit goods. At the outer edges of the seam only one of the needle-threads is crossed between the parallel rows of stitches, thus making the seam light and thin at these portions.

What we claim is:

1. In a seam, the combination with fabric of four approximately parallel lines of stitches, the stitches of one or more of said lines being formed of a single thread, a thread of some of the lines of stitches crossing at intervals to an adjacent line of stitches, and passing around the thread thereof, thereby interconnecting on one side of the goods the two inside lines of stitches and each outside line of stitches with its adjacent inside line of stitches.

2. In a seam, the combination with fabric, of four approximately parallel lines of stitches the two outside lines thereof being single-thread chain stitches, some of the stitch forming threads crossing at intervals on one and the same side of the fabric each to an adjacent line of stitches and passing around the thread thereof, thereby interconnecting the two inside lines of stitches and

each outside line of stitches with its adjacent line of stitches, all on the same side of the goods.

3. In a seam, the combination with fabric, of four approximately parallel lines of stitches, one or more lines thereof being single-thread chain-stitches, some of the threads at each stitch crossing to adjacent lines of stitches and passing around shanks of loops thereof, thereby interconnecting all four lines of stitches, said crossing of threads being all on the same side of the fabric.

4. In a seam, the combination with fabric, of four approximately parallel lines of stitches, the outside lines thereof being single-thread chain-stitches, the loops of the latter crossing to the adjacent inside line of stitches and passing around the shanks of loops thereof, and a thread of one inside line crossing at intervals to the other inside line and passing around the shanks of loops therein, said crossing of threads being all on the same side of the fabric.

5. In a seam, the combination with fabric, of four approximately parallel lines of stitches, the outside lines thereof being single-thread chain-stitches, the loops of the latter crossing at each stitch to the adjacent inside line of stitches and passing around the shanks of loops thereof, and a thread of one inside line crossing at each stitch to the other inside line and passing around the shanks of loops thereof, said crossing of threads being all on the same side of the fabric.

6. In a seam, the combination with fabric, of four approximately parallel lines of

stitches, the outside lines thereof being single-thread chain-stitches, the loops of the latter crossing at each stitch to the adjacent inside line of stitches and passing around the shanks of loops thereof, and a thread of each inside line crossing at each stitch to the other inside line and passing around the shanks of loops thereof, said crossing of threads being all on the same side of the fabric.

7. In a seam, the combination with fabric, of four approximately parallel lines of single-thread chain-stitches, the loops of each outside line of stitches crossing to adjacent inside lines of stitches and passing around the shanks of the loops thereof, and the loops of one inside line crossing to the other inside line and passing around the shanks of the loops of the latter.

8. In a seam, the combination with fabric, of four approximately parallel lines of single-thread chain-stitches, the loops of each outside line of stitches crossing to adjacent inside lines of stitches and passing around the shanks of the loops thereof, and the loops of each inside line crossing to the other inside line and passing around the shanks of the loops of the latter.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

STOCKTON BORTON.
LLEWELLYN D. BIRGE.

Witnesses:

RALPH H. CHAPMAN,
A. H. MACOMBER.